L4: Entry 1 of 2 File: USPT Oct 19, 2004

US-PAT-NO: 6807466
DOCUMENT-IDENTIFIER: US 6807466 B2

TITLE: System and method for steering a multi-wheel drive vehicle

DATE-ISSUED: October 19, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Strothmann; Thomas	Wallenhorst			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Invacare Corporation	Elyria	OH			02

APPL-NO: 10/279606 [PALM]
DATE FILED: October 24, 2002

PARENT-CASE:
CROSS-REFERENCES TO RELATED APPLICATIONS This application is a continuation of application Ser. No. 09/773,793, filed Feb. 1, 2001, now U.S. Pat. No. 6,526,336, and titled "System and Method for Steering a Multi-Wheel Drive Vehicle."

INT-CL-ISSUED: [07] G06F 7/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	B62 D 7/15	20060101
CIPS	B62 D 9/00	20060101
CIPS	B62 D 11/06	20060101
~~CIPS~~	~~B62 D 11/02~~	20060101

US-CL-ISSUED: 701/1; 701/89, 701/90, 701/41, 701/81
US-CL-CURRENT: 701/1; 701/41, 701/81, 701/89, 701/90

FIELD-OF-CLASSIFICATION-SEARCH: 701/1, 701/89, 701/90, 701/41, 701/81
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	3897840	August 1975	Molzahn et al.	
☐	4322670	March 1982	Taylor	
☐	4334694	June 1982	Iwanicki	
☐	4754824	July 1988	Olsson	
☐	4790399	December 1988	Middlesworth	
☐	4926954	May 1990	Ataka et al.	
☐	5109694	May 1992	Yahagi et al.	
☐	RE34057	September 1992	Middlesworth	
☐	5157611	October 1992	Ikeda et al.	
☐	5168953	December 1992	Naito	
☐	5305218	April 1994	Ghoneim	
☐	5769510	June 1998	Akuzawa et al.	
☐	5794203	August 1998	Kehoe	
☐	5879061	March 1999	Koibuchi	
☐	6072424	June 2000	Cremona et al.	
☐	6167354	December 2000	Maleki et al.	
☐	6223116	April 2001	Kin et al.	
☐	6275753	August 2001	Kyrtsos	
☐	6282479	August 2001	Ghoneim et al.	
☐	6295487	September 2001	Ono et al.	
☐	6313742	November 2001	Larson	
☐	6526336	February 2003	Strothmann	701/1

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
WO 93/08063	April 1993	WO	
WO 00/32462	June 2000	WO	

ART-UNIT: 3661

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Hernandez; Olga

ATTY-AGENT-FIRM: Pejic; Nenad Calfee, Halter & Griswold

ABSTRACT:

A system and method of controlling a multi-wheel drive vehicle is provided. The

invention is preferably applicable to the steering of such a vehicle and determines the individual velocities for each wheel drive. In this regard, the invention includes two general steps. The first step includes determining the distance of each wheel drive and a vehicle velocity reference point from a turning reference point. The second step includes ratioing each wheel drive's distance from the turning reference point with the vehicle velocity reference point's distance from the turning reference point. The ratios are then applied to a vehicle velocity associated with the vehicle velocity reference point to determine the velocity of each respective wheel drive. Once determined, the velocities are output to each wheel drive.

23 Claims, 5 Drawing figures

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L4: Entry 2 of 2 File: USPT Feb 25, 2003

US-PAT-NO: 6526336
DOCUMENT-IDENTIFIER: US 6526336 B2

TITLE: System and method for steering a multi-wheel drive vehicle

DATE-ISSUED: February 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Strothmann; Thomas	Wallenhorst			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Invacare Corp.	Elyria	OH			02

APPL-NO: 09/773793 [PALM]
DATE FILED: February 1, 2001

INT-CL-ISSUED: [07] G06F 7/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	B62 D 7/15	20060101
CIPS	B62 D 9/00	20060101
CIPS	B62 D 11/04	20060101
CIPS	B62 D 11/02	20060101

US-CL-ISSUED: 701/1; 701/89
US-CL-CURRENT: 701/1; 701/89

FIELD-OF-CLASSIFICATION-SEARCH: 701/1, 701/89, 701/90, 701/41, 701/81
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	3897840	August 1975	Molzahn et al.	180/6.48

☐	4322670	March 1982	Taylor	318/587
☐	4334694	June 1982	Iwanicki	280/154.5
☐	4754824	July 1988	Olsson	180/6.48
☐	4790399	December 1988	Middleswrth	180/6.2
☐	4926954	May 1990	Ataka et al.	180/140
☐	5109694	May 1992	Yahagi et al.	73/9
☐	RE34057	September 1992	Middlesworth	180/6.2
☐	5157611	October 1992	Ikeda et al.	364/426.02
☐	5168953	December 1992	Naito	180/197
☐	5305218	April 1994	Ghoneim	364/426.02
☐	5769510	June 1998	Akuzawa et al.	303/188
☐	5794203	August 1998	Kehoe	704/271
☐	5879061	March 1999	Koibuchi	303/146
☐	6072424	June 2000	Cremona et al.	342/109
☐	6167354	December 2000	Maleki et al.	702/147
☐	6223116	April 2001	Kin et al.	701/82
☐	6275753	August 2001	Kyrtsos	701/36
☐	6282479	August 2001	Ghoneim et al.	701/70
☐	6295487	September 2001	Ono et al.	701/22
☐	6313742	November 2001	Larson	340/442

ART-UNIT: 3661

PRIMARY-EXAMINER: Cuchlinski, Jr.; William A.

ASSISTANT-EXAMINER: Hernandez; Olga

ATTY-AGENT-FIRM: Pejic; Nenad Calfee, Halter & Griswold LLP

ABSTRACT:

A system and method of controlling a multi-wheel drive vehicle is provided. The invention is preferably applicable to the steering of such a vehicle and determines the individual velocities for each wheel drive. In this regard, the invention includes two general steps. The first step includes determining the distance of each wheel drive and a vehicle velocity reference point from a turning reference point. The second step includes ratioing each wheel drive's distance from the turning reference point with the vehicle velocity reference point's distance from the turning reference point. The ratios are then applied to a vehicle velocity associated with the vehicle velocity reference point to determine the velocity of each respective wheel drive. Once determined, the velocities are output to each wheel drive.

24 Claims, 5 Drawing figures

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Application Number [ ] Submit

IDS Flag Clearance for Application 10815308

IDS Information

Content	Mailroom Date	Entry Number	IDS Review	Last Modified	Reviewer
M844	2005-03-17	23	Y ☑	2005-04-11 13:25:27.0	elane
M844	2004-04-01	11	Y ☑	2004-07-20 16:22:10.0	gmyers
Update					